

REMARKS

Claims 1-20 are all the claims pending in the application. By this Amendment, Applicant amends claims 1 and 10 to further clarify the invention. In addition, Applicant adds claims 15-20. Claims 15-20 are clearly supported throughout the specification, *e.g.*, pages 5-6 of the specification.

Summary of the Office Action

The Examiner rejected claims 1, 4, 5, 8, and 10 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,524,144 to Suzuki (hereinafter “Suzuki”) and claim 3 under 35 U.S.C. § 103(a) as being obvious over Suzuki.

In addition, Examiner rejected claims 2, 6, 7, 9, and 11-14 under 35 U.S.C. § 103(a). In particular, claim 2 is rejected as being unpatentable over Suzuki in view of ITU-T G.692, “Optical Interfaces for multichannel Systems with Optical Amplifiers”, October 1998, pp. 1, 4-5 (hereinafter “ITU-T G.692”), claims 6 and 7 are rejected as being unpatentable over Suzuki in view of U.S. Patent No. 5,822,106 to Knox et al. (hereinafter “Knox”), claim 9 is rejected as being unpatentable over Suzuki in view of W. Bo et al., “Fiber Gratings Based Optical Add/Drop Multiplexer with Low Interferometric Crosstalk”, International Conference on Communication Technology, ICCT’98, October 22-24, 1998 (hereinafter “Bo”), claims 11-13 are rejected as being unpatentable over Suzuki in view of U.S. Patent No. 6,023,366 to Kinoshita (hereinafter “Kinoshita”), and claim 14 is rejected as being unpatentable over Suzuki in view of U.S. Patent No. 5,847,862 to Chraplyvy et al. (hereinafter “Chraplyvy”).

Claim Rejections under 35 U.S.C. § 102(b)

Claims 1, 4, 5, 8, and 10 are rejected under 35 U.S.C. § 102(b) as being anticipated by Suzuki. Applicant respectfully traverses this rejection and requests the Examiner to reconsider the rejection in view of the following comments.

Of these claims, only claim 1 is independent. Claim 1 requires: “wherein each one of the set of channel regenerators regenerates only a predetermined respective group of channels, each respective group forming a non-overlapping subset of a set of channels to be regenerated, and each channel of the groups is predetermined based on channel wavelength.” From hereinafter, this recited limitation will be referred to as “a predetermined group of channels is a non-overlapping subset of a set of channels to be regenerated” for the sake of linguistic convenience only.

The Examiner asserts that claim 1 is directed to a multichannel wavelength-division multiplex fiber optic transmission system and is anticipated by Suzuki. In particular, the Examiner asserts that Suzuki’s terminal device which serves as an optical receiver and transmitter for some channels and optical repeater for other channels is equivalent to a regenerator for a predetermined set of channels as set forth in claim 1 (see pages 2 and 8 of the Office Action).

In response to Applicant’s arguments, the Examiner alleges that Suzuki only amplifies a predetermined group of channels, a subset of the set of channels (see page 7 of the Office Action). Applicant respectfully submits, however, that Suzuki’s terminal 5 fails to teach or

suggest a regenerator regenerating a predetermined respective group of channels, where this group of channels is a non-overlapping subset of a set of channels to be regenerated.

Suzuki teaches using an optical sender 1, an optical receiver 2 and three optical repeaters 3 and an optical fiber 4. The optical repeater may change the transmission rate depending on the wavelength. For example, a terminal device 5 performs channel branching and channel combination by means of optical demultiplexer 54 and optical multiplexer 55, and serves as an optical sender 51 or an optical receiver 52 for certain wavelength and as an optical repeater 53 for other wavelengths (Fig. 9; col. 12, lines 25 to 35).

Suzuki, however, teaches that all the wavelengths, which are not branched out through an optical receiver 52 or through an optical sender 51 are handled in a similar manner, *i.e.* they are all amplified by the optical repeater 53. That is, in Suzuki, in the first terminal, channels λ_3 - λ_8 are not branched out to the optical receiver or to the optical sender as such they are placed in the optical repeater. In the second terminal of Suzuki, it is channels λ_2 - λ_7 that are not branched to the optical receiver or to the optical sender, and as a result, these channels are sent to the repeater. In other words, in Suzuki, the channels that are sent to the repeater are not a non-overlapping subset of a set of channels to be regenerated but simply all channels not branched out to the receiver or the sender.

In short, Suzuki fails to teach or suggest repeating only a subset of channels from a set of channels to be amplified. In Suzuki, all the channels that should be amplified are amplified by the repeater 53. That is, in Suzuki, a set of channels to be amplified are channels λ_3 - λ_8 , and all of these channels are amplified. In addition, Suzuki fails to teach or suggest a predetermined

group of channels forming a non-overlapping subset of said set of channels to be amplified. In Suzuki, a group of channels to be repeated in one repeater may also be repeated in another repeater. For example, Suzuki teaches that the first terminal amplifies channels λ_3 - λ_8 and that the second terminal amplifies channels λ_2 - λ_7 (Fig. 9). The two sets of channels that are amplified by the two terminals clearly overlap. In Suzuki, a channel amplified by one terminal may also be amplified by another terminal. In other words, Suzuki fails to teach or suggest having a repeater repeat a predetermined group of channel where the group of channels is a non-overlapping subset of channels. In short, Suzuki fails to teach or suggest a regenerator for a predetermined group of channels where the group is a non-overlapping subset of the channels to be regenerated.

Therefore, a predetermined group of channels is a non-overlapping subset of a set of channels to be regenerated as set forth in claim 1 is not suggested or taught by Suzuki, which lacks a regenerator for a predetermined respective group of channels, where the group is a non-overlapping subset of a set of channels to be regenerated. For at least these exemplary reasons, Applicant respectfully submits that independent claim 1 is patentably distinguishable from (and patentable over) Suzuki. Applicant, therefore, respectfully requests the Examiner to reconsider and withdraw this rejection of independent claim 1. Also, Applicant respectfully submits that claims 3-5, 8, and 10 are allowable at least by virtue of their dependency on claim 1.

In addition, with respect to the dependent claim 10, Suzuki clearly fails to teach or suggest a regenerator having a regeneration unit and an amplifier. For at least this additional reason, Applicant respectfully requests the Examiner to withdraw this rejection of claim 10.

Claim Rejections under 35 U.S.C. § 103(a)

The Examiner rejected claims 2, 6, 7, 9, and 11-14 under 35 U.S.C. § 103(a). Applicant respectfully traverses these rejections in view of the following comments.

Claim 2

Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki in view of ITU G.692. Applicant respectfully traverses this rejection with respect to the dependent upon claim 1, claim 2. Applicant has already demonstrated that Suzuki does not meet all the requirements of independent claim 1. ITU G.692 is relied upon only for its teachings of a number of repeaters being a sub-multiple of the number of channels (see page 3 of the Office Action). Clearly, ITU-G.692 does not compensate for the above-identified deficiencies of Suzuki. Together, the combined teachings of these references would not have (and could not have) led the artisan of ordinary skill to have achieved the subject matter of claim 1. Since claim 2 is dependent upon claim 1, it may be patentable at least by virtue of its dependency.

Claims 6 and 7

Claims 6 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Suzuki in view of Knox. Applicant respectfully traverses this rejection with respect to the dependent upon claim 1, claims 6 and 7. Applicant respectfully traverses this rejection with respect to the dependent upon claim 1, claims 6 and 7. Applicant has already demonstrated that Suzuki does not meet all the requirements of independent claim 1. Knox is relied upon only for its teachings of a synchronization unit (see page 4 of the Office Action). Clearly, Knox does not compensate for the above-identified deficiencies of Suzuki. Together, the combined teachings of these

references would not have (and could not have) led the artisan of ordinary skill to have achieved the subject matter of claim 1. Since claims 6 and 7 are dependent upon claim 1, they may be patentable at least by virtue of their dependency.

Moreover, there is no motivation to combine the references in a manner suggested by the Examiner. The Examiner alleges that one of ordinary skill in the art would have been motivated to combine Suzuki and Knox “because this enables a common clock signal to be used for all channels” (see page 4 of the Office Action). Applicant respectfully submits that Suzuki does not teach or suggest any sort of a synchronization unit, whereas a common clock signal is important for defining a time window for the synchronization. In other words, in digital systems, it is important for the signals to be synchronized within a defined time windows. As a result, the digital systems often have clock signals to define this time window (*e.g.*, see col. 1, lines 10 to 30 of Knox). Knox tries to improve the method of defining a time window by replacing a number of different clocks with a single common clock.

Suzuki, on the other hand, fails to teach or suggest a synchronization unit or any sort of clocks. Knox relates to a system improving the timing window for synchronizing a digital system by having a one common clock. There is no motivation to combine Knox, which teaches a common clock for defining a timing window for synchronizing the logical signals and Suzuki, which is not related to a synchronization of the signals. In short, one of ordinary skill in the art would not have been motivated to combine Suzuki and Knox in a manner suggested by the Examiner. For at least this additional reason, Applicant respectfully requests the Examiner to withdraw this rejection of claims 6 and 7.

Claim 9

Claim 9 stands rejected under 35 U.S.C. § 103(a) as being anticipated by Suzuki in view of Bo (W. Bo et al., “Fiber Grating Based Optical Add/Drop Multiplexer with Low Interferometric Crosstalk”, International Conference on Communication Technology, ICCT’98, October 22-24, 1998). Applicant respectfully traverses this rejection with respect to the dependent upon claim 1, claim 9. Applicant has already demonstrated that Suzuki does not meet all of the requirements of independent claim 1. Bo is relied upon only for its teachings of a four-channel WDM transmission system, which uses fiber grating (see pages 4-5 of the Office Action). Clearly, Bo does not compensate for the above-identified deficiencies of the Suzuki reference. Together, the combined teachings of these references would not have (and could not have) led the artisan of ordinary skill to have achieved the subject matter of claim 1. Since claim 9 is dependent upon claim 1, it is patentable at least by virtue of its dependency.

Claim 11-13

Claims 11-13 stand rejected under 35 U.S.C. § 103(a) as being anticipated by Suzuki in view of U.S. Patent No. 6, 023, 366 to Kinoshita (hereinafter “Kinoshita”). Applicant respectfully traverses this rejection with respect to the dependent upon claim 1, claims 11-13. Applicant has already demonstrated that Suzuki does not meet all of the requirements of independent claim 1. Kinoshita is relied upon only for its teachings of a four-channel WDM transmission system (which uses repeaters to amplify all channels in the system) and its teachings of a supervisory channel (see pages 5-6 of the Office Action). Clearly, Kinoshita does not compensate for the above identified deficiencies of Suzuki. Together, the combined

teachings of these references would not have (and could not have) led the artisan of ordinary skill to have achieved the subject matter of claim 1. Since claims 11-13 are dependent upon claim 1, they are patentable at least by virtue of its dependency.

Claim 14

Finally, claim 14 stands rejected under 35 U.S.C. § 103(a) as being anticipated by Suzuki in view of U.S. Patent No. 5,847,862 to Chraplyvy et al. (hereinafter “Chraplyvy”). Applicant respectfully traverses this rejection with respect to the dependent upon claim 1, claim 14. Applicant has already demonstrated that Suzuki does not meet all the requirements of independent claim 1. Chraplyvy is relied upon only for its teachings of placing amplifiers between the regenerators (see page 6 of the Office Action) and as such clearly fails to cure the deficient teachings of Suzuki. Together, the combined teachings of these references would not have (and could not have) led the artisan of ordinary skill to have achieved the subject matter of claim 1. Since claim 14 is dependent upon claim 1, it is patentable at least by virtue of its dependency.

In addition, Applicant respectfully submits that one of ordinary skill in the art would not have been motivated to combine the references in a manner suggested by the Examiner. The Examiner asserts that one of ordinary skill in the art would have been motivated to combine the two references because Chraplyvy’s amplifiers minimize the placement of expensive regenerators (see page 6 of the Office Action).

In the Amendment under 37 C.F.R. § 1.111 filed on April 28, 2004, Applicant argued that one of ordinary skill in the art would not have been motivated to combine the references in a

manner suggested by the Examiner. In particular, Applicant argued that Suzuki's repeaters are very similar to Charplyvy's amplifiers. In fact, it is Suzuki's repeaters that amplify the signal, thereby avoiding expensive regenerator. In short, Charplyvy's teaching of a particular placement of amplifiers is very similar to Suzuki's teaching of a repeater to avoid/minimize the number of regenerators. In short, one of ordinary skill in the art would not have been motivated to combine Charplyvy's amplifiers on top of Suzuki's repeaters. The two perform similar functionality and achieve similar result. As such, there is no motivation to combine the references in the manner suggested by the Examiner. This argument was not rebutted by the Examiner. Applicant, therefore, respectfully submits that for at least this additional reason dependent claim 14 is patentable.

New Claims

In order to provide more varied protection, Applicant adds claims 15-20. Claims 15-20 are patentable at least by virtue of their dependency on claim 1.

Conclusion and request for a telephone interview

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly invited to contact the undersigned attorney at the telephone number listed below.

Amendment under 37 C.F.R. § 1.111
U.S. Patent No.: 09/493,091

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